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EXAMINER

THOMPSON, CAMIE S

ART UNIT

PAPER NUMBER

1774

DATE MAILED: 06/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/976,349

Applicant(s)

MOORE ET AL.

Examiner

Camie S Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-15, 17, 19 and 20 is/are rejected.
- 7) ☒ Claim(s) 5 and 16 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's amendment and accompanying remarks filed April 10, 2003 have been acknowledged.
2. Examiner acknowledges amended claims 2-5, 8-9, 11 and 15-16.
3. Examiner also acknowledges cancelled claim 18 and newly added claims 19 and 20.
4. The objection of claims 8-9 and 11 is withdrawn due to applicant's amended claims.
5. The rejection of claims 2-4 and 15 under 35 U.S.C. 112, second paragraph is withdrawn due to applicant's amended claims.

Specification

6. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 2, 6, 10-11, 15, 17 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Segal et al., U.S. Patent Number 3,920,879.

Segal discloses long glass fiber reinforcement wherein the fibers are intertwined or agglomerated long glass fibers held together by adhesive resinous binders or mechanically bound by stitching as per instant claims 1-2, 6 and 17 (see abstract and column 4, lines 16-44). In addition, the reference discloses that the polymer used in the reinforcement is polyamide as per instant claims 10 and 11 (see column 4, lines 16-44). The Segal reference discloses that the length of the fibers at 2 to 5 inches or longer is the most effective for load bearing strength (see column 3, lines 26-36). Using glass fibers in a polyamide resin would produce an aspect ratio of less than 5, as this is a physical property of the fibers in the resin matrix. Therefore, this feature is inherent.

Claims 2 and 15 are product by process claims. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art was made by a different process.

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9. Claims 1, 6-7, 9 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Moghe et al., U.S. Patent Number 5,127,783.

Moghe discloses carbon fiber reinforced composites wherein the carbon fibers can be twisted as per instant claims 1 and 6 (see column 3, lines 42-68 and claim 19). In addition, the reference discloses that the binder system includes an organic resin such as polyimide resins as per instant claims 7 and 9 (see column 7, lines 21-46). Using carbon fibers in a polyimide resin would produce an aspect ratio of less than 5, as this is a physical property of the fibers in the resin matrix. Therefore, this feature is inherent.

Claim 15 is a product by process claim. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art was made by a different process.

10. Claims 1-2, 6-8 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Raley, U.S. Patent Number 4,761,322.

Raley discloses a laminated fibrous composite wherein a first fibrous layer is bonded to a second fibrous layer and the suitable bonding medium is an epoxy-resin based adhesive as per instant claims 1-2 and 7-8 (see column 5, lines 50-68; column 7, lines 36-45 and column 9, lines 1-10). Raley also discloses that the fibers used can be Kevlar, glass and carbon as per instant claims 6 and 17 (see column 8, lines 3-20). Using glass, carbon or Kevlar fibers in epoxy resin would

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produce an aspect ratio of less than 5, as this is a physical property of the fibers in the resin matrix. Therefore, this feature is inherent.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-4, 6, 12-15, 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raley, U.S. Patent Number 4,761,322 in view of Tatarchuck et al., U.S. Patent Number 5,102,745.

Raley discloses a laminated fibrous composite wherein a first fibrous layer is bonded to a second fibrous layer and the suitable bonding medium is an epoxy-resin based adhesive as per instant claim 1 (see column 5, lines 50-68; column 7, lines 36-45 and column 9, lines 1-10). Raley also discloses that the fibers used can be Kevlar, glass and carbon as per instant claim 6 (see column 8, lines 3-20). Raley does not disclose the type of multi-dimensional fiber array. Tatarchuck teaches mixed fiber composite structures wherein at least the first fiber has a plurality of bonded junctions at the first fiber crossing point (see abstract and column 3, lines 65-68). In Figures 1A-

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ID of Tatarchuck, triangular and square structures are formed as per instant claims 3 and 4.

Additionally, the Tatarchuck reference teaches that the bonding of the fibers may be done by thermosetting, which would include using a thermoformable polymer as per instant claim 10 (see column 6, lines 20-29).

Neither reference discloses the height to width ratio of the coupled fiber reinforcement structure as per instant claim 14. The height to width ratio affects the strength and flexibility of the multi-dimensional array. This is an optimizable feature. Discovery of optimum values of result effective variables involves only routine skill in the art in re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA). Therefore, it would have been obvious to one of ordinary skill in the art to have a height to width ratio of the coupled fiber reinforcement structure be about one in order to have increased strength and flexibility for the fibrous array.

Neither reference discloses the aspect ratio of the coupled fiber reinforcement structure as per instant claims 1 and 12-13. Using glass, carbon or Kevlar fibers in epoxy resin would produce an aspect ratio of less than 5, as this is a physical property of the fibers in the resin matrix.

Therefore, this feature is inherent.

Neither reference discloses the diameter of the fiber as per instant claim 20. The diameter of the fibers affects the load bearing features of the composite. Discovery of optimum values of result effective variables involves only routine skill in the art in re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA). Therefore, it would have been obvious to one of ordinary skill in the art to have a diameter of five to twenty micrometers for the fibers in order to obtain a composite with more efficient load bearing properties.

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Claims 2 and 15 are product by process claims. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art was made by a different process.

13. Claims 5 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

14. Applicant's arguments filed April 10, 2003 have been fully considered but they are not persuasive. Applicant argues that the Segal reference does not disclose an aspect ratio of less than 10. The Segal reference uses glass fibers and a polyamide matrix as does the applicant. Therefore, it would be expected that the Segal reference would have the same aspect ratio of the fiber structure of the instantly claimed invention. Applicant also argues that the conventional production techniques found in the Segal reference produces a structure with no integral coherent structural strength. The process in which the composite is made does not make it a different product. Additionally, the Segal reference uses long glass fibers, with a length of 5 inches or longer as does the instantly claimed invention. Therefore, the process in which the composite is made does not render patentability to the product, which is recited by the Segal reference. Applicant argues that Raley reference does not disclose a matrix phase. The Raley reference teaches that the fibrous layers are bonded to one another with a suitable bonding medium such as

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an epoxy resin based adhesive in column 9, lines 1-10 of the Raley reference. Applicant argues the combination of the Raley and Tatarchuk references. Both references are drawn to fiber composite structures, thus making them analogous art. The form of the structure provides increased mechanical strength and combining the Tatarchuk reference with the triangular and square structure to the Raley reference is not without motivation. Therefore, the combination of Raley and Tatarchuk is obvious and proper.

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (703) 305-4488. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly, can be reached at (703) 308-0449. The fax phone numbers for the Group are (703) 872-9310 {before finals} and (703) 872-9311 {after finals}.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

CYNTHIA H. KELLY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

Cynthia H. Kelly